

Remarks

New drawings are provided for figures 1A-1D, 6A-6B, and 7A-7B. The issues that were raised with regard to each are addressed by the new sheets of drawings. All figures are in black and white only. The specification has been amended to correspond to the drawings as labeled. Claims 86 and 94 have been amended so that they do not depend from a withdrawn claim. Claim 86 has been amended to recite that the connexin improves electrical conductivity of cells, as taught at paragraph 27. New claims 98 and 99 recite increased conduction velocity and decreased APD80, respectively, as taught at paragraph 49.

No new matter is added by this amendment.

Double Patenting

Claims 86 and 94 stand rejected over U.S. 6,124,620 for non-obvious type double patenting. This rejection is traversed.

Claim 86 has been amended to recite that “the connexin is expressed in the cells and improves the electrical conductivity of the cells.”

The reference patent allegedly teaches fibroblasts as one type of cell to transform. The rejection points to the patent’s abstract for this teaching. Applicants could not find the term “fibroblast” in the abstract or in the entire patent. Applicants request that the U.S. Patent and Trademark Office clarify the assertion of the teaching of fibroblasts.

The rejection points to the tenth paragraph of the detailed description of the ‘620 patent (column 4, lines 50-65) as teaching the introduction of connexins into cells. The ‘620 patent teaches:

Introduction of inducible ion channel genes can also be **used to slow and/or block conduction**. For example, this can be achieved by overexpression of K channels, decrease of sodium or calcium channel activity (e.g., by decoy beta subunits), or manipulation of cell-cell communication (e.g., by **dominant-negative or nonfunctional connexins**). In the AV node, one can achieve modification of atrioventricular conduction velocity and/or pattern, e.g., to control ventricular rate in atrial fibrillation, or to modify conduction in AV nodal reentrant tachycardia. In the tricuspid annulus, one can induce bidirectional block and prevent atrial flutter. In the atrium, one can induce lines of conduction block or slowing to terminate or to prevent atrial fibrillation (e.g., a genetic "maze" procedure). In the ventricle, one can

induce bundle-branch block as a means of achieving discoordinate activation, e.g., in hypertrophic cardiomyopathy. (emphasis added)

The reference ‘620 patent teaches the use of dominant-negative or nonfunctional connexins which slow or block conduction. It does not teach or suggest the use of biologically functional connexins which improve the electrical conductivity of the cells. Such improvement is required in claim 86. It does not teach or suggest increasing the conduction velocity of the cells as required in claim 98. It does not teach or suggest decreasing the APD80 (action potential duration at 80 % of repolarization) of the cells, as required in claim 99.

Because the ‘620 patent fails to teach or suggest these aspects of the claimed invention, it fails to render claims 86, 94, 98, or 99 obvious.

Please withdraw the rejection.

The rejection of claims 86 and 94 under 35 U.S.C. § 102(e)

Claims 86 and 94 stand rejected as anticipated by Lee, U.S. 7317950. This rejection is respectfully traversed.

The rejection asserts that Lee teaches fibroblasts (claim 20) which are adapted to express connexin (claim 21) and a construct to express connexin which is a lentivirus (paragraph spanning columns 27 and 28). However, Lee fails to teach a lentivirus vector. Lee teaches a lentivirus ***promoter*** at column 28, line 3. When Lee does teach vectors for use, he teaches “plasmid or viral construct (e.g. adeno associated virus, adenovirus, and the liked) (sic).” Column 27, lines 55-57. This does not constitute a teaching or a suggestion of using the lentiviruses as recited in claims 86 and 94.

Thus Lee fails to anticipate the claimed invention because Lee does not teach all the elements of the claimed invention.

Please withdraw the rejections and objections.

Respectfully submitted,
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